



Workbench

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Contributions

Contributions can be soft copy (on floppy½ disk) or hard copy. It will be returned if requested and accompanied with a self-addressed envelope. The editor of the Amiga Users Group Inc. newsletter Workbench retains the right to edit contributions for clarity and length. Send contributions to: Amiga Users Group P.O. Box 2389 Seaford Victoria 3198 tonym@net2000.com.au

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Editorial

Happy Christmas everyone,

This month we have articles covering the Elbox Trojan Horse code fiasco. Thankfully Elbox have fixed their little indiscretion. We have a rather long article covering MorphOS. If you've been confused about MorphOS then this article should clear the air on Amiga OS 4's closest competitor. We also have the final in my Future Tech series, meeting pics from October/November and all the current Ami news.

Don't forget this months meeting is December the 8th, one week earlier than usual. So until next year, have a happy Christmas and a great start to the new year from all the AUG committee. Cheers :-)

Tony Mulvihill



Last Months Meeting

November 17th 2002

Latest news and info.

A demonstration of DFX, the inline floppy adaptor made to allow std floppies to work with Amigas Amithlon and WinUAE.

A demonstration of networking between an Amiga and a Win98 box using TCP/IP and Samba File shifting and VNC was demo'ed. VNC is a remote control program along the lines of Nortons' PCanywhere, only VNC is free and an Amiga server and client is available. It was most strange to see a fully functioning Win98 desktop and just a screen flip away, an Amiga Workbench.

News that in the week or so that the AmigaONE had become available

over 30 units were sold by Anything Amiga, most of which were the G4 version.

This Months Meeting

December 8th 2002

Version 2 of Amiga Quake has been released. This version supports 68k, PPC and MorphOS.

I'll be demonstrating the 68k version on my machine at Decembers meeting and if you've got a fast, network capable Amiga (that is you've got an ethernet card in your Ami with an RJ45 connector) bring it along and well get a game of network Quake happening. I can connect up to 8 machines with my switch.

Latest news and info from our bringer of Ami news, David Myers.

Next Years Meeting

Sounds like a long way from happening but it's only around a month and a half away.

We'll have the Sun room booked for next year but the dates are not confirmed yet. Look for more info in next years first issue of Workbench.

Bytes & Pieces

Letting the World Know

November 19, 2002 -
With the AmigaOne now shipping and AmigaOS 4.0 in its final stages of development and testing, the time has come to begin letting the rest of the world know the good news, that the Amiga is alive, well and ready to let the World have fun with computing again.

<http://www.amiga.com/corporate/111902-exposure.shtml>



Fake OS 4 beta

We have been informed that there is a fake OS 4 beta circulating supposedly produced by **HYPERion** (!) which contains "amusing" commentary such as "x megabytes leaked but OS 4 will have virtual memory anyway". It is possible that this archive contains malicious code and we therefore urge users not to download and run it.



Ben Hermans/Hyperion

fxPAINT 2.0 in December



fxPAINT is an award-winning graphics program for AmigaOS, MorphOS, Amithlon, PowerUP and WarpUP covering many different fields of graphical applications. Besides others, more than 90 high quality effects for image processing, natural painting tools, image-management, batchprocessing- and numerous internet tools are available to you. More information on fxPAINT can be found on the fxPAINT-homepage.

We are proud to announce the long awaited version 2.0 of fxPAINT today. fxPAINT 2.0 includes many new features, that will open up new graphical horizons to you. Besides the generally improved working speed and many new effects, a lot has been done at the modules, too. The fxALBUM- and fxCONV(batch processing)-

modules have been heavily extended, new modules like e.g. the "Navigation Builder" and the "Color variations"-wizard have been added.

One of the most important new features is the support for gradients that may consist of a theoretically unlimited number of colors and transparency-values. Together with the also brand-new gradient tool you can easily add gradients to pictures or use them as background.

Furthermore direct support for TrueType®-fonts, PNG-files (loading and saving, incl. all options like alpha-channel, etc.), the system clipboard and Turboprint has been added. The ARexx-port and its nearly 90 new commands as well as the numerous scripts contained offer additional functionality.

fxPAINT 2.0 will, besides the support for 68K-systems, also offer native support for MorphOS, Amithlon, PowerUP



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and WarpUP and thus, independent of which platform it runs on, allow you to work at full speed. An adaption for AmigaOS 4.0 is already being worked on and will be made available as a free download upon the time of completion.



On the fxPAINT-page you can now find benchmark results that document the speed gains through native support of x86 and PPC. The routines, already very fast on 68K, run - depending on the effect/operation - more than 7 times faster on an 180 MhZ PowerPC and more than 40 times faster on Amithlon running on a 850 MhZ Athlon.

An overview over all, including many more, new features as well as the possibility to purchase fxPAINT 2.0 at a time-limited special price can be found on the all-new fxPAINT 2.0 subpages. Delivery is scheduled for the first half of December 2002."

<http://www.iospirit.de/fxpaint/>

Trojan Horse

By Tony Mulvihill

Elbox are the well known Polish Amiga hardware manufacturers known for their innovative quality hardware, such as the Mediator PCI busboard expansion cards and PCI card drivers CD, the MrooCheck serial mouse adaptor, their range of excellent flicker-fixers and scandoublers, harddrive adaptors and their Power Tower kit range.

As great as their hardware and software is (I myself have 4 pieces of Elbox hardware and I'll vouch for it anyday), they lack good PR relations. This has been painfully



obvious in their public statements. Maybe it's because of the Polish culture or language differences or maybe it's just the way they are but anyway they made a major blunder recently when an individual discovered secret code in their software drivers, that if activated, destroys the RDB (Rigid Disk Block) of an Amiga harddrive.

This so called (by Elbox) anti-piracy protection in the Elbox software doesn't actually prevent piracy but rather is a revenge mechanism that will wipe the RDB of the boot harddrive. The Rigid Disk Block of an Amiga contains the boot and partition table and as well can contain all the file systems used by the harddrive. Wiping the RDB effectively means you can no longer access your data on the harddrive. The data is still there but you'll have a major job to get it all back and usable. It will require specialised software tools and an experts knowledge. One wrong mistake and poof... your data is gone for good.

The main problem was the fact that the code could be activated by accident. It only took a random memory write to activate the RDB code and



the Amiga is well known for rogue programs that overwrite memory at random locations. Plus once knowledge of the code got out, virus writers could exploit the code by purposefully activating it and thus destroying your data. Never mind the fact the Elbox Trojan Horse code is actually against the law in most countries of the world.

First Elbox denied the existence of the code. Then when more and more well known Amiga programmers checked for, found and verified the code existed, they finally came clean and said the code existed in ALL their software. However the statement Elbox released is confusing and ambiguous and pretty much blames everyone else but themselves. You can read the Elbox statement by following the links at the end of the article.

Consider the Elbox code like a car company releasing a car with an anti-theft device which is a big bomb. Now the car company doesn't tell you your car comes with a bomb

Elbox Crash Code



that will blow up if your car gets stolen and when you finally discover that bomb, the company first denies it exists, then acknowledges it does exist and say it won't go off in normal use, despite the fact it's been proven all it takes to set it off is to hit a random pothole. Finally the car company says it's everyone else's fault they installed a bomb and that it's perfectly safe but recall the car and remove the bomb anyway. Would you be happy with that car company?

Fortunately Elbox released an updated driver package to registered Elbox customers which removes this destructive Trojan Horse code. So yes....Elbox are IMHO (in my humble opinion) arrogant and self serving but equally have designed some of the



best and innovative Amiga hardware and provide the best support of any Amiga company I have ever encountered.

At the moment there is no competition for Elbox's hardware but when the AmigaONE and OS 4.0 takes off, the Amiga market will grow and be more healthy and competition is sure to emerge and force Elbox to clean up their act. PR aside, their service is excellent.

As an example of their excellent service I have received no less than 14 updates to my mediator software since I first purchased and registered with them in early 2001.

So would I still buy and recommend Elbox gear for Amiga owners? Certainly. Elbox have removed the offending code from their software and their hardware is of a high quality and innovative design.

Have Elbox changed their underhanded ways? I doubt it but more Amiga programmers will be scrutinising Elbox's software from now on so we can be pretty sure anything underhanded will show up quickly.



If you're after some Elbox gear from an Australian dealer give Anything Amiga a phone call, or if you are familiar with internet ordering, Power Computing in England is also a good source.

Pictures:

Previous Page,

An Elbox Mediator SX 1200 busboard. This board expands an A1200 to six PCI slots and allows the use of an ATX power supply

Above:

The 4 port Spider USB card for Mediator equipped systems.

Left:

The A4000 Mirage tower kit.

Links

http://www.elbox.com/news_02_11_18b.html

http://www.elbox.com/news_arch.html

MorphOS in Detail

By Nicholas Blachford

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Thendic-France SARL 16th

November 2002

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2. The Past: The History of MorphOS
3. The Present: The structure of MorphOS
4. The Present: The A-Box
5. The Future: The Q-Box
5. Further Information

This document was written to describe MorphOS, how it came about, its workings, its current status and future plans. Special thanks go to bplan and the MorphOS developers for the great deal of assistance given.

Introduction

MorphOS is a new Operating System for PowerPC RISC microprocessors which runs on the Pegasos computer and PowerUP (CyberstormPPC, BlizzardPPC) expansion cards for the Amiga. It has also been tested on the Mai Logic Teron CX and Teron PX evaluation boards. In the future MorphOS will also run on other Open Firmware based PowerPC machines and possibly some PowerPC based Apple Macintosh computers as well.

It currently runs on 603e, 604e, 750 and 7400 (Original G4) PowerPC processors.

MorphOS is a well named combination of the old and the new. It originally started in 1995 with a plan to migrate Amiga to PowerPC but eventually 'morphed' into an entire Operating System in it's own right which includes compatibility with Amiga applications. In the future it will change again becoming a truly modern, highly advanced operating system yet retaining compatibility with existing applications through it's system of OS boxes.

In the Beginning - The History of MorphOS

To add some perspective and for completeness, before going into detail, this section describes how the MorphOS project started and it's subsequent history.

The Amiga started on its long arduous path to the PowerPC processor in 1995. While there have been and still are other projects to do this, with MorphOS 1.0 the original project is finally being completed.

In September 1995 there was an agreement between Amiga Technologies and the German

company phase5 to develop a migration



path for the Amiga to move to the PowerPC from the Motorola 680x0 (68K) series processors which were coming to the end of their life, this was the genesis of the MorphOS project.

Unfortunately this agreement was short-lived as Amiga Technologies' parent company Escom went bankrupt. However the project did not die as phase5 decided to go ahead and continue with the migration process. This led to phase5 launching in 1997 a series of PowerUP add-on cards for the Amiga providing RISC based acceleration for the first time. Programs ran on both the 68K and some functions were accelerated through the use of the PowerPC processor and a PPC native library.

There were many plans made and agreements between phase5 and other companies but as the numerous twists and turns in the Amiga story occurred companies went out of business and none of these

plans came to fruition, eventually with the decline in the Amiga market phase5 themselves went bankrupt. Later a new company, bplan was formed and the project was picked up again but this time it was to be completed as an Operating System in it's own right without any components from the original. In 2000 as it moved towards completion, MorphOS was released as a public beta for PowerUP card owners.

The 2002 public MorphOS 1.0 release on the PowerPC based Pegasos represents the final chapter in the 7 year long transition to PowerPC from the original 68K based propriety hardware. MorphOS does not require the original hardware or include any of the original system software but it does very much include the same spirit and feeling - a computer which is fast and fun to use!

The Structure of MorphOS

The MorphOS System is based around the minimalist Quark microkernel. On top of the kernel are currently two "Boxes" the first, currently in the final stages of development is the A-Box, the second box currently in development is the significantly more advanced

Q-Box.

At the time of writing (November 2002) most development has focused on the A-Box but considerable design work has been done on the Q-Box.

The A-Box can run Amiga RTG (Re-Targetable Graphics) applications as it includes a complete PowerPC native clean-room reimplementation of version 3.1 of the Amigas' Operating System (herein AOS) and a JIT (Just In Time compiler) based 68K emulator.

The Q-Box on the other hand shall be new and will require it's own applications, but by including compatibility with Amiga applications through the A-Box, MorphOS is able to start with an existing, mature application base while the Q-Box is in development.

It is also possible that in the future other boxes may be added allowing compatibility with applications from other operating systems. Possibilities here are to add Unix / Linux and BeOS application compatibility. It should however be noted that these are only possibilities at this point and various issues have to be considered before adding compatibility for these systems.

The A-Box



The original purpose of MorphOS was to keep the Amiga alive by providing an upgrade path to modern hardware.

Users can already use emulators to run original applications on other platforms but these work by emulating the 68K processor and the custom chips. While this emulation is complete and accurate, a great deal of potential performance is lost in doing all the emulation.

While MorphOS has moved on from what it was originally built for it still retains compatibility with AOS 3.1. However it uses a different technique which allows software to take full advantage of modern hardware. The A-Box includes a clean-room implementation of the AOS 3.1 API created using publicly available documentation. This has been written and compiled on the PowerPC so it is nearly 100% native. There is also a 68K emulator for existing applications, the performance of which is boosted

significantly by a JIT (Just In Time compiler) which converts 68K code into native PowerPC code then caches it largely removing the overhead emulation usually incurs. In addition to being native, the A-Box is faster than the original at running applications due to different techniques and being used within the system. This provides a further boost in system performance.

For maximum performance however it is a simple process to compile code natively to the PPC. This allows Amiga applications to take full advantage of the PowerPC CPUs' performance.

One important point to make however is that there is no emulation of the Amiga custom chips. Consequently MorphOS cannot itself run applications which require them. This is not as much of a problem as one might imagine since applications from AOS 2.0 onwards have been able to use API calls which are not hardware dependant. If a user wants to run applications which require the custom chips (e.g. many games), they can use UAE (Ubiquitous Amiga Emulator), this provides emulation of the full Amiga hardware and runs on various platforms including

MorphOS.

AOS originally ran on what are now obsolete systems with only a fraction of the computing power available in today's modern microprocessors. Amiga speeds were quoted in MIPS (millions of instructions per second), the MIPS rating for a 1Ghz IBM G3 is over 2,000 times higher than the original 68000 based Amiga. Despite this the original Amigas responsiveness was - and still is - very high. Consequently, given that the A-Box provides a more efficient PPC native implementation, it's responsiveness will appear surprisingly fast to any PC owner especially given the relatively low clock speed (600MHz) of the initial systems.

File Systems Support

MorphOS supports a number of File Systems and others can be supported via plug-ins: OFS (Original File System) FFS (Fast File System) FFS 2 (Fast File System 2) PFS 3 (Professional File System 3) SFS (Smart File System)

Chill Out - The Ambient Desktop

The MorphOS desktop



replacement for Workbench is called Ambient and being part of the A-Box feels like the environment it emulates. It is able however to take advantage of the changes and advancements in the graphics system so unlike the Amigas' Workbench it supports 24bit displays and blending. Displaying the contents of a window while it's moving is another feature provided by the graphics system used by Ambient. MUI (Magic User Interface) is also incorporated making Ambient highly customizable.

Other Graphical Enhancements

Unlike the original, the graphics system is now fully abstracted away from the hardware, it has also been significantly enhanced with many new features such as transparency and overlays. Accelerated 3D graphics are implemented using the Rave3D API and a wrapper for the Warp3D API is in

development, OpenGL compatibility is also in the pipeline.

The Audio system has also been improved with the addition of AHI, this is a retarget table API for Audio so Applications can take advantage of systems with audio hardware better than the original (these days, all of them).

When launched AOS was a highly advanced operating system, it included pre-emptive multitasking in 1985 - a feature not added to other desktop Operating Systems (i.e. to Windows or MacOS) until much later. Compared to modern Operating Systems however, the Amiga has it's fair share of limitations, i.e. there is no memory protection or virtual memory present as standard.

Because it includes a faithful re-implementation of the AOS 3.1 API specification the A-Box design was largely fixed and could not be made radically different. Consequently the A-Box has many of the same basic limitations present in the original. Some of these have been worked around with extensions but in some cases the limitations are either too difficult or impossible to

remove without completely breaking compatibility with applications. These however are limitations of the A-Box, not MorphOS as a whole, the Q-Box shall not have these problems.

Q - The Future of MorphOS

The Q-Box

Up to now the development has been concentrated on the A-Box. In the future this focus shall switch to Q.

Q shall consist of an enhanced Quark kernel, a set of servers to provide functionality and the Q-Box in which applications run. The Quark Kernel itself is very small providing a hardware abstraction layer, drivers, memory management and message passing. Most of the real work will be done in the servers, i.e. Networking, File System, GUI, Media, Security, 2D/3D Graphics etc.

Applications shall run in the Q-Box and make API calls via a message passing system. The API shall not be locked to any single programming language so application developers will not be required to learn a new language. The message passing is also extremely fast, instead of transferring the data in the message, the memory location of the message is

remapped to the application where the



messages are directly copied as this method is faster for very small amounts of data.

Scalability and Other Bits

The message passing system used within MorphOS means the system can be highly scalable. The components sending and receiving messages can be running on different processors or even physically different computers and the messages will still get there. A windowing system over a network (a-la The X Windowing System) could be implemented in this manner but the result is likely to be a great deal more responsive. An X Windows compatible wrapper is planned so X Windows applications can be ported but the resulting speed on the desktop will be very different from those using current X Windows implementations.

The distributed capability of Q messaging means clustering will be possible without

having to rewrite the entire OS. Applications requiring massive numbers of processors will be relatively simple to write under Q. One requirement of large scale applications is a large memory footprint, workstations and large servers have been 64 bit for many years now but this is yet to reach consumer level Operating Systems. Q was designed with 64 bit capability in mind from the start, it shall not be a bolt-on to an existing 32 bit OS. Applications will, from the start have access to address ranges much, much larger than existing desktop Operating Systems.

Microkernel Vs Macro Kernel

A common problem encountered in the development of microkernel Operating Systems is speed. This is due to the CPU having to context switch back and forth between the kernel and user processes, context switching is expensive in terms of computing power. The consequence of this has been that many Operating Systems have switched from their original microkernel roots and become closer to a macrokernel by moving functionality into the kernel, i.e. Microsoft moved graphics into the Windows NT kernel,

Be moved networking inside, Linux began as a macrokernel so includes everything. This technique provides a speed boost but at the cost of stability and security since different kernel tasks can potentially overwrite one another's memory.

Given the above, one might wonder why Q can be based on a microkernel (strictly speaking it's only "microkernel like") and still expected to perform well. The answer to this lies in the fact that MorphOS runs on PowerPC and not x86 CPUs. It is a problem with the x86 architecture that causes context switches to be computationally expensive. Context switching on the PowerPC is in the region of 10 times faster, similar in speed to a subroutine call. This means PowerPC Operating Systems can use a microkernel architecture with all it's advantages yet without the cost of slow context switches. There are no plans for an x86 version of MorphOS, if this changes there will no doubt be internal changes to accommodate the different processor architecture.

Transition

At time of writing the Quark kernel exists but is

incomplete. The rest of Q is still only at the



have been worked out but the fine details have yet to be filled in. Drivers are for instance included in the A-Box where they can get to the hardware directly. In the future the drivers shall be moved into the Quark kernel where they will be independent of the A-Box and indeed of any other boxes, this has the advantage of making them usable by all the boxes. This move has been pre-planned so drivers were written with it in mind and the move shall be a relatively trivial operation.

Vapour Where?

Almost all the information here about the Q-Box is in the future and this could lead to accusations of us generating vapourware. We are only setting out our goals here and how we plan to achieve them. However as is normal in the world of computing things change so this is all subject to change. Development of complex systems always takes a great deal of time, we are

Morph OS in Detail

Get Bored!!



looking at ways of getting the system into the market as soon as possible but the final product will of course take time.

The future will expand on the work already done and provide MorphOS users with a truly modern Operating System designed and built by now long experienced developers who know the benefits and advantages of the past but also have the knowledge and experience of

what not to do and the paths not to follow.



Further Information

For details of MorphOS news and links see:

www.morphos-news.de

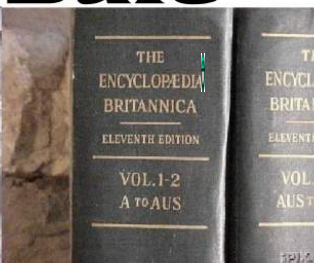
For more details of the Pegasos main board see:

www.pegasosppc.com

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Laughter



By Tony Mulvihill

A few months ago I looked at LEP (Light Emitting Polymers) and electronic ink. This month we'll have a look at what makes both electronic ink and LEP displays possible, the plastic transistor.

Transistors are small switching devices that work as an amplifier, in that they switch and modify a larger electrical signal. They are at the heart of all modern electronic devices from washing machines to computers and a single integrated circuit or "chip" can have anywhere from several hundred to several million transistors etched onto it's substrate.

The heart of a transistor is an etching on a piece of silicon, which is known as a semi-

conductor. It is the nature of silicon being a semi-conductor that has both prevented and lead to the development of plastic transistors.

Traditionally transistors generate heat and sometimes lots of it (Note the huge heat sinks and fans needed on processors these days). Heat is a no go for plastic as it would melt, silicon can handle heat OK but has no flexibility, you cannot bend a sheet of silicon. So in order to have floppy, bendable displays and rollup electronic paper, engineers had to develop flexible, heatless transistors and they have succeeded in doing just that. Using new chemical and engineering processes, they have developed relatively heatless transistors made out of plastic and capable of being printed onto a flexible substrate using similar

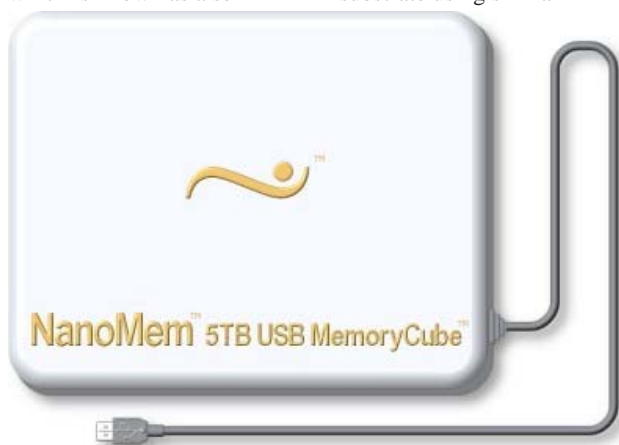


techniques to printing LEP (light emitting polymer) displays. This printed layer of transistors provides the electronic switching matrix needed to operate both LEP and electronic ink displays.

By building up or stamping a layer of transistors on a flexible substrate, engineers have succeeded in the break through development of the low power flexible control mechanism that's needed in the production of thin, flexible rollup displays for both electronic ink and LEPs.

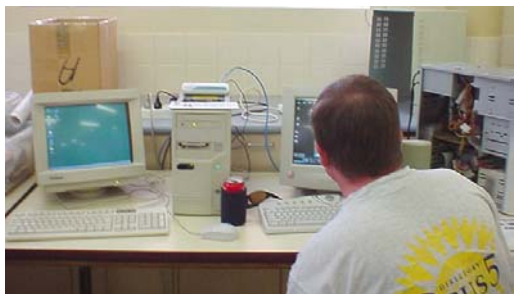
Plastic transistor development has also had some downflow effect to other electronic devices, such as rechargeable lithium ion thin film batteries (batteries the thickness of a sheet of paper) and very large capacity memory devices for computing like the 5 Terabyte (5 trillion bytes) USB memory cube which measures just 2.5 x 10 x 14.5 cm.

Technology is leading us in many strange and fantastic ways. What was science fiction just a few years ago is becoming science fact. Now if we could only discover FTL



Oct/Nov Meeting Pics

Get Bored!!



Left from top-October Pics.
Bernie Meyer, Amithlon author.
Cyberstorm PPC card.
Meeting crew.
Row of Workbenches.

Right from top-November Pics.
The developer of DFX.
DFX installed in A1200.
Networking between
Amiga and Win98.

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welcome to our site

domains

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Work**bench**

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Queensland

Don Quixote Software

PO BOX 786, Toowoomba, 4350

Phone: (076) 391 578

Synapse Computers

190 Riding Road, Hawthorne, 4171

Phone: (07) 3899 0980

<http://www.uq.net.au/~zzjason>

Keyboard Electronics, (Ralph Down)

Unit 5/15 Pinter Drive,

Southport, Q'land 4215,

Phone (07) 5591 6188.



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AMIGA[®]one



AUG Contact Information

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About The Group

The Amiga Users Group Inc. is a non-profit association of people interested in the Amiga family of computers and related topics. We do not support or condone software piracy. To contact us

<http://www.aug.org.au>

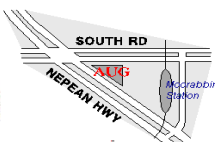
Membership

The AUG Inc. membership year runs from

| | |
|---|------|
| September to August. If you are joining in: | |
| August-September | \$25 |
| October-November | \$21 |
| December-January | \$17 |
| February-March | \$13 |
| April-May | \$33 |
| June-August | \$29 |

Mail to.

Amiga User Group
PO Box 2389 Seaford Vic 3198



Amiga Disk and Book Library

AUG has a collection of Amiga books, magazines and programs. Members can borrow for a period of one month. The library is available at most meetings.

World Wide Web Access

The vast array of internet providers can make choosing a provider for yourself a difficult task. The AUG can help with advice and a helping hand with setting up your own internet access.

Members Mailing List

The AUG moderates a members mail list at Yahoo Groups. Help, advice or anything Amiga related can be discussed.

http://yahogroups.com/group/Amiga_Users_Group_Vic

The Dead Letter Department

The AUG's BBS run by Craig Hutchison has access to all the latest AmiNet files as well as other goodies. Registration is free to all members.

Phone: (03) 9571 7194

Meetings

The Amiga Users Group meets at the Moorabbin Arts Centre Complex, 979 Nepean Hwy, Moorabbin (see map) on the 3rd Sunday of each month from 2:00pm to 6:00pm. There is ample parking at the rear of the complex off South Road. Meetings are held in either Workshop 1 or the Sun Room. Ask at reception if you get lost. Cost: \$2.00. This is to cover some of the rental costs.

Membership Form

First Name:.....Surname:.....

Address:.....

Post Code:.....Email:.....

Phone (AH):.....Phone (BH):.....

I have enclosed a cheque or money order as outlined in the table above. Once admitted as a member of the Amiga Users Group (Vic) Inc. I agree to abide by the rules of the association for as long as I continue to be a member.

Signed:

Date: / / 2002

If joining by mail please allow 2-3 weeks for your membership to be processed. (The following is optional)

Year of Birth: Amiga models:

Occupation:

Where did you hear of the AUG ?:

Can you assist the AUG to provide services ?: